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The Making of "Under the Caribbean" (1954). The production and technical history of a pioneering underwater color film.

Abstract

Hans Hass' underwater film "Under the Caribbean" (german title "Unternehmen Xarifa"), made in 1954/55 in the Caribbean and the Pacific, was shot at a time of great technical change in color film technology. It was a Technicolor color film that required a particularly large amount of technical, organizational and financial effort. Until then, the colorful splendor of tropical coral reefs had never been depicted in a feature film. In this respect, this color film is a milestone in film history.

The film also ushered in a change in the way the oceans were viewed. While they had previously been viewed primarily as a resource that could be exploited economically, this view changed, not least thanks to films such as "Under the Caribbean". The purely economic view gave way to an ecological awareness.

The essay reports on the preparations and technical execution of the work on the underwater color film and the equipment that was used. A brief historical review is provided to place the film in the context of the state of production technology at the time.

The 90-minute film was Hans Hass' main cinematic work.

Introduction

The tropical underwater world is naturally very colorful. However, this colorfulness is lost with increasing depth, as the spectral colors of the sunlight are gradually filtered out. After just a few meters, there is no more red to be seen. Then orange disappears, and finally yellow and green. At depths of over 50 meters, only the color blue is dominant. As the depth increases, the light disappears completely. This filtering effect of the water is not only vertical, but also horizontal. In order to make the colors visible again, the use of powerful underwater spotlights is essential. This means, that the "color production" under water is created during the shoot by using underwater spotlights, which bring the entire color spectrum that has been filtered out by the water back into the depths. One cannot yet speak of "color production" in the sense of a manufacturing process, but rather of "making colors visible" again.

In the early 1950's underwater cameras and spotlights were custom-built for this purpose, as such color films had hardly been shot under water before [1].

Underwater filming as a scientific research method

The Austrian Hans Hass (1919-2013) had been gathering experience with underwater filming and photography since 1938. During his expeditions in 1938 in the Adriatic near Dubrovnik and in 1939/40 in the Caribbean near Bonaire and Curacao, Hans Hass discovered underwater photography and underwater film as his new field of interest. It was a pioneering field in which there was hardly any experience at the time. The lighting conditions under water were different to those on land, and as water has a different refractive index to air, the use of film material and camera technology was mainly a trial and error method.

Hass established a new filming method with free-floating filming, as previously only fixed cameras with tripods had been used. The decisive technical requirements for free-swimming filming were, in addition to the appropriate physical fitness of the cameraman, small, handy cameras and high-intensity lenses and films.

Haifisch-Mensch und Umweltforschung

Was sagt die Wissenschaft zu den Unterwasserbegegnungen von Hans Haß?

Die Berichte des jungen Studenten Hans Haß in der Urania-Filmbühne über seine Unterwasserbegegnungen mit Haien und anderen Großfischen sind Sensation. Was Haß leistete, ist jedoch nicht allein Sport und Abenteuer. Sein neuartiger Vorstoß in die Lebensbereiche der Fische eröffnet der Forschung neue Möglichkeiten, ist andererseits die Bestätigung der Umweltlehre des Hamburger Biologen Professor Baron von Uexküll, den man als einen der aufmerksamsten Zuhörer und berufensten Sachverständigen in der Urania erwarten durfte. Der im 77. Lebensjahre stehende Gelehrte weilt jedoch zurzeit als Gast des ihm befreundeten schwedischen Arztes und Schriftstellers Axel Munthe auf dessen berühmter Besitzung San Michele auf Capri.

Ein Gespräch nun des Mitarbeiters des von Uexküll begründeten Hamburger Instituts für Umweltforschung Zell mit Hans Haß bestätigte das große Interesse der Wissenschaft an dieser Art der Unterwasserforschung. Sie erlaubt es, das Tier in seiner natürlichen Umwelt zu sehen. Im Aquarium, in der Gefangenschaft sind die Umweltbedingungen der Fische dagegen nicht mehr normal, wie die Tatsache beweist, daß viele Fische im Aquarium ihre Farben ändern und die Fähigkeit des schnellen Farbwechsels verlieren.

Die wohl überraschendste von Haß berichtete Tatsache, die Flucht angreifender Haie vor dem menschlichen Unterwasserschrei findet entsprechend der Uexküllschen Lehre ihre Erklärung darin, daß der Hai hier vor eine ihm völlig fremde Tatsache gestellt wird, auf die er keine Reaktion ausgebildet hat.

Wie weit das Auge des Haies und die Seitenlinie als Strömungsorgan ihn bei der Auffassung der Geschehnisse seiner Umwelt leiten, ist eine noch offene Frage. Die besondere Bedeutung der Seitenlinie ergibt sich unter anderem aus der Beobachtung von Haß, daß Haie beim Liebesspiel mit den Seitenflossen schlagend nebeneinander liegen, ohne sich zu berühren. W. Wunder hat nachgewiesen, daß ein blinder Hecht durch den Strömungssinn zu seiner Beute geleitet wird. Die Untersuchungen Wunders erbrachten weiter den Nachweis, daß das am Beutefang beteiligte Sinnesorgan des Hechtes die Kopfseitenlinie ist, während die allgemeine Orientierung im Wasser offenbar durch die Rumpfseitenlinie erfolgt. Hier wie auch beim Hai wird man unterscheiden müssen zwischen Alarmierung des Tieres und seiner Leitung zur Beute hin.

Hamburger Versuche von H. W. Lißmann im Institut für Umweltforschung mit Kampffischen zeigten andererseits, daß bei diesen angriffslustigen Zierfischen das Auge das Leitorgan für den Beutefang ist, wobei es vor allem darauf ankommt, daß sich die Beute bewegt. Kampffische greifen ihr eigenes Spiegelbild an, aber auch Attrappen hinter der Aquariumwand, auch wenn diese Attrappen nur grob die Gestalt eines Kampffisches haben. Hauptsache, daß sie sich bewegen! Helligkeit und Farbe der Beute oder des Feindes spielen jedoch auch eine Rolle. Aus diesen bereits vorliegenden Arbeiten ergeben sich zahlreiche Anregungen für das Verständnis der abenteuerlichen Unterwasserjagden von Hans Haß, für Fragestellungen und Versuche auf seinen zukünftigen Fahrten. eb.

Illustration 1: The scientific value of Hans Hass's underwater observations and film recordings was recognized early on. Source: Hamburger Tageblatt, 8 März 1941, p. 1 (Hans Hass Archive)

Hass initially developed the necessary underwater cameras himself. They consisted of standard cameras that were inserted into self-designed waterproof housings [2]. Initially, Hass used a Zeiss Movikon K 16 as a film camera with a spring mechanism. The camera was designed for 16mm Kodak film cassettes with 15 meters of film. Later he used 16mm cameras from Siemens & Halske.

Underwater filming became a central part of Hass's new research method, namely scientific diving with scuba equipment. Hass not only documented the fauna and flora underwater with the film camera, but was also able to record the behavior of the animals in their habitat. This had not been possible until then, as fish and other animals do not display their natural behavior in aquariums. Hass's aim was for scuba diving to become a new method not only for underwater filming, but for marine research in general. The researcher was to enter the natural habitat of the animals himself [3]. Hass coined the catchy image of the researcher as a "fish among fish".

Hass studied zoology in Berlin during the war and wanted to equip his own research vessel to conduct underwater research in tropical coral reefs together with other scientists. He developed a new, lightweight diving device with the Draegerwerk in Lübeck, used it for the first time in Greece in 1942 for marine biology research and financed the purchase of a research ship through a film, lectures and books. The conversion work of his sailing ship SEETEUFEL to a research vessel was delayed further and further due to the war, and at the end of the war his ship was seized by the Allies.

Hass soon made a new start and bought a second ship, the sailing yacht XARIFA, in 1952 [4]. The income from his film „Under in the Red Sea" (1952), which he had shot shortly before during an expedition, was particularly important. The black-and-white film was a great success, was shown in cinemas worldwide and won the International Long Documentary Award in Venice in 1951.

After the purchase of the XARIFA, Hass' fortune was exhausted. However, a considerable amount of money was needed for the ship's special equipment and to carry out a research expedition that was to last almost a year and had several scientists on board. As Hass did not receive any state funding, he had to finance everything himself as a private individual. As he had already experienced with his film "Under the Red Sea", funds of the required magnitude could only be obtained through a successful film.

Challenges for the film work

The budget of a single producer was not sufficient for the planned, large-scale new expedition in post-war Germany. A co-producer therefore had to be found. Hass concluded contracts with Herzog-Filmverleih in Munich in the fall of 1952 and with Sascha-Film in Vienna in the spring of 1953. License fees of 300,000 marks and also 300,000 schillings were agreed. Werner Tischendorf, the director of Herzog-Film at the time, made precise demands on the film: it was to be a feature-length expedition film with the character of a feature film in color using the Technicolor process, primarily to make it easier to market.

The requirement for a color feature film was a particular challenge for Hass, as such a film project could no longer be realized with 16 mm hand-held film cameras, as he had previously used underwater. However, it was not only a technical problem, but also a personnel problem, as Hass needed a professional film team at his side to meet the high demands of a successful feature film. Hass therefore hired UFA cameraman Irmen Tschet for the above-water shots and former English Navy diver Jimmy Hodges for the underwater shots. Hodges had experimented with new underwater film techniques for the Royal Navy in the post-war years, helped develop a deep-sea camera and worked as an underwater cameraman on the English black-and-white documentary "Beneath the Seven Seas" (1952). Together with Charles Vinten, Hodges had developed an underwater housing for a 35 mm film camera [5]. Sadly, Hodges died in a diving accident shortly before the end of the XARIFA expedition near Bonaire in April 1954. Hass dedicated his film "Under the Caribbean" to him.

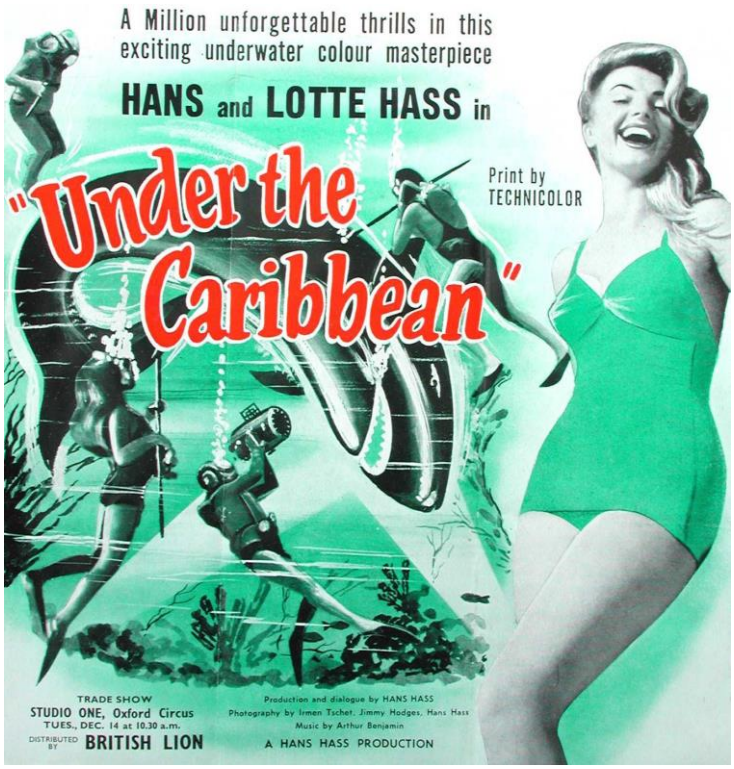
A Million unforgettable thrills in this exciting underwater colour masterpiece
HANS and LOTTE HASS in
"Under the Caribbean"
Print by TECHNICOLOR
TRADE SHOW
STUDIO ONE, Oxford Circus
TUES., DEC. 14 at 10.30 a.m.
DISTRIBUTED BY BRITISH LION
Production and dialogue by HANS HASS
Photography by Irmen Tschet, Jimmy Hodges, Hans Hass
Music by Arthur Benjamin
A HANS HASS PRODUCTION

Illustration 2: Film Poster for cinemas. Source: Hans Hass Archive.

Cameras, films and lighting

Several film cameras and color techniques were used during the film expedition. Two Vinten-Hodges 35 mm cameras were used underwater, which did not have a reflex viewfinder for underwater use. An assessment of the sharpness is only possible after estimating the distance. This is a very difficult task, especially when using long focal lengths with telephoto lenses. The viewfinder is a so-called frame viewfinder with different cut-outs, corresponding to the different lenses used. A third underwater

camera was the 16mm camera made by Arnold and Richter in Munich. A 35 mm ARRI camera was used for filming above water.

The negatives were repeatedly sent to Humphries Laboratories in London during the expedition, where they were developed and the exposure and sharpness assessed. The laboratory sent this information back to Hass so that the camera settings could be adjusted for the next shots if necessary.

“Under the Caribbean” was filmed on Kodak 35mm Eastman Color and 16mm Kodachrome reversal material with standard underwater cameras, and this was later converted to Technicolor in the lab. Three different color processes were used. This shows how important color and brilliance were for this production.

A major technical problem was the question of suitable underwater film lighting, as water filters out the spectral colors with increasing depth. Artificial lighting was therefore essential to bring out the colors properly. This was a considerable leap in technology compared to previous underwater films.

The lighting was technically and operationally complex as follows: two generators of 30 kilowatts each on board the XARIFA supplied the necessary energy. 300 and 500-meter-long power cables, which could be joined together and then had a weight of over 1000 kg, led into 2 switch and distribution boxes. These, installed in the dinghy, distributed the power to a further 120 meters of thinner cables, at the end of which were five watertight film spotlights of 3 and 5 kilowatts. To make it easier to handle the heavy supply cables under water, they were fitted with glass buoys at intervals of 6 meters - as was customary on fishing nets as floats at the time.

The extremely high light output of this elaborate underwater lighting showed the colors for the first time in a true explosion of color in tropical coral reefs. The XARIFA thus became not only a floating research station, but also a floating power station to supply the spotlights with electricity.

Illustration 3: Underwater shots with a large spotlight. It had to be placed close to the object to be filmed so that there was no major loss of color due to the filter effect of the water. Source: Hans Hass Archive.

Color film under water

The use of color film material for underwater photography was a financial and technical challenge. Color film material was already being used sporadically underwater in the 1920s, mainly on an experimental basis. In 1924, the American John Ernest Williamson worked with color film material for underwater shots in the silent film “The Uninvited Guest”. The film had a short sequence, shot with two-strip Technicolor material, and was praised by the press. It was described as having the “best effects yet achieved”[7]. However, Williamson did not shoot as a diver, but used a large closed tube in which he could descend to the bottom and film through a glass window, similar to a submarine.

The Frenchman Yves le Prieur also filmed underwater with color film as early as 1938, but the potential of the material was not fully exploited because no spotlights were used to bring the color spectrum back into the underwater world. To put it simply, all so called “underwater color films” were now blue and white instead of black and white.

It was not until the early 1950s that underwater spotlights were used, bringing different colors to underwater film. The protagonists here were, to name but two, the Austrian Kurt Schaefer and the Frenchman Dimitri Rebikoff, who each made a short, unscripted documentary film about their underwater explorations in 1952. Both were shown publicly in cinemas, including in Austria [7]. Schaefer illuminated and filmed the growth on the inner walls of a sea cave, and Rebikoff the red corals living at great depths in the Mediterranean Sea. Both films were still niche productions of animateurs and went largely unnoticed.

The age of cinema films with underwater color began in 1953. The documentary “The Sea around us”, produced in Technicolor based on the book of the same name by Rachel Carson, and awarded an Oscar for best documentary, shows the formation of the oceans and the use of water by humans. It also looks at the diversity of life in the oceans and addresses climate change and its possible consequences, such as rising sea levels.

Two other underwater color films from 1953 and 1954 are worth mentioning, namely the American Cinemascope film “Beneath the 12-Mile Reef” and the Italian “Alle Conquistades sesto Continente”. The American adventure film from 1953 depicts the fictional experiences of a sponge diver on the coast of Florida and ends in an underwater battle with a giant artificial octopus. The Italian documentary depicts the events of an expedition that led to an archipelago in the southern Red Sea. The aim of the expedition was to collect marine animals and corals in order to examine and catalog them later in Rome. The film contains a large number of underwater scenes in which fish of all shapes and sizes are harpooned, and was already advertised as a Technicolor film, although, as was later the case with “Unternehmen Xarifa”, only the screening copies were produced using this process, not the original recording tapes. Underwater spotlights were not used in either the American or the Italian film.

Contemporary underwater films were still mainly about the violent conquest of a new world. They still used colonial clichés by painting a traditional, one-sided picture of the underwater world as a dangerous and threatening place.

Conclusions

The German film distributor Herzog-Film followed the competing productions in the underwater color film sector very closely. “Unternehmen Xarifa” had not yet been completed when the film distributor was already putting pressure on Hass to speed up its completion, as the Disney studios in Hollywood were filming Jules Verne's “20,000 Leagues Under the Sea” in Technicolor at the same time. Hass fulfilled the distributor’s wish, as his film premiered seven weeks before the Disney film. The film “The silent world” (french title “Le Monde du silence”) by Jacques-Yves Cousteau and Louis Malle was not released in cinemas until February 1956.

The world premiere of the German-language version of the film “Unternehmen Xarifa” took place on November 4, 1954 in Düsseldorf at the Residenz Theater. In Austria and Switzerland, the film was shown under the title “Giants of the Sea”, which refers to the dramatic underwater scenes with sperm whales at the end. The English-language version was premiered on December 9, 1954 at the Empire Theater in London. In the years that followed, the film was shown in many countries around the world.

The underwater color shots were a success factor of the film. The warm and rich Technicolor colors, emphasized by the underwater lighting, created a strong contrast to the blue background and thus a kind of artificial reality. This was unusual for viewers, who had never seen this colorful world before.

Hass had to perform a balancing act with his documentary, which is embedded in a storyline, and was criticized for it. Scientists, for example, resented him for being too sensationalist. The age of public science had not yet dawned, and Hass was ahead of his time with his film. Scuba divers, on the other hand, criticized it for having too many long-winded, scientific scenes. The colorful underwater shots were also sensational for the time, and one reviewer even suggested that some of them could have been shot in an aquarium [8]. Hass then obtained a counterstatement in the newspaper.

Illustration 4: This frame grabs from „Under the Caribbean" show the huge underwater lights and a coral reef near Bonaire, which is illuminated by a spotlight. Source: Hans Hass Archive.

The film "Under the Caribbean" acts as a bridge, not only from a film-historical point of view, but also from the perspective of environmental protection [9]. It represents the link between the first generation of underwater films, in which the sea is seen as an object for violent conquest and economic, colonial exploitation, and a new generation with a different perspective. The focus here is on raising awareness of the importance of the sea for humanity. "Under the Caribbean" provides initial food for thought on the need to protect the environment and the sea. Hans Hass promoted a better understanding of the processes in the sea and showed that the oceans are not empty spaces but full of life and are of great importance for the future of our planet. With his expeditions, Hass became a role model for a new generation of marine explorers.

As Franziska Torma states, „the invention of underwater color film … created visual ocean ecologies", and films like "Under the Caribbean" "gave the underwater world ecological significance, and connected the oceans to Planet Earth"[10]. However, "Under the Caribbean" did not yet initiate a direct paradigm shift, because until well into the 1960s, the underwater world was still seen primarily as a colonizable space full of unused resources and a new settlement site to protect against the threat of overpopulation.

"Under the Caribbean", however, was a beacon of light and showed a new direction. The film is set on the threshold of the environmental age, in which the finite nature of the earth's natural resources came into focus. Hans Hass played an active role in shaping the transition to the environmental age and also did a great deal for marine conservation in later years. He was a strong advocate of environmental protection, published several manifestos and films from 1971 onwards, including one on the ban on underwater hunting, and received a large number of honors for his work.

Hans Hass, who was dubbed "The Aquatic Eye of science" in 1959 due to his insightful underwater films, played his part in opening up the underwater world with his films and books [11]. His own fascination with the underwater paradise and respect for nature were probably the prerequisites for sensitizing people to environmental protection with his films even back then. "Under the Caribbean" is a prime example of this with its colorful underwater shots.

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